RE-PRINTED BY SPECIAL PERMISSION

AUDIO NOVEMBER/1965

EQUIPMENT PROFILE

...the original magazine about high fidelity!

VIKING STUDIO 96/RP 120 TAPE RECORDER SYSTEM

This is the cream of the Viking line and sweet cream it is too. This is not "sub-professional" equipment; it is, by all standards, broadcast grade. As the heading indicates, there are actually two units involved here. The Studio 96 is the transport and the RP 120 the all solid-state stereo record/play amplifier.

The Transport

The Studio 96, upon first examination impresses one with its solid bulk. It weighs in at 50 pounds and that's heavy even for such a deck. The front of the transport is distinguished by its lack of clutter, as seen in *Fig.* 1. There are the two reel platters, set far enough away to accommodate 10½-inch reels. There are the two head covers separated only by the slot into which the tape falls. A three-position digital counter is located in the upper cover. Finally, across the lower portion of the transport are four telephone-type switches. Each of these has three positions. The first switch, from the left (facing the transport), selects the proper hold-back tension for the feed reel, 10, 7 or 5 inches. The second switch is the speed selector. Its three positions are labelled HIGH, OFF, and LOW. This controls only the capstan speed. Our sample had as its high speed 7½ ips. and, as its low speed, 3¾ ips. Transports are also available at 15-7½ and 3¾-1⅞.

The third switch is labelled PLAY, STOP, CUE. And, the final one is called out at FAST FORWARD, STOP, and REWIND.

Under the grey hammertone, 5/32-in. steel panel are the real complexities of this transport. *Figure* 2 shows the rear, with the three motors. Two, for take-up and rewind, are hefty 1-amp, 6-pole units. These use extensions of their rotors as the center of the tape reel. The third motor is a two-speed, hysteresis-synchronous unit of inside-out construction. This drives the capstan via a triple belt arrangement that wraps around the 3½-lb. capstan flywheel. It should be pointed out that this drive motor is considerably larger than the usual run-of-the-mill phono-type motors.

All mechanical operation is by solenoids or relays. One solenoid operates the pinch roller in the play mode. A second offers a unique fail-safe service. Braking on the Studio 96 is by direct current application to the appropriate motors. So too, is the hold-back tension. These, of course, would become inactive in the event of a power failure during operation. So there is a separate solenoid connected to a pair of mechanical brakes. These are normally on. When the deck is activated, the solenoid pulls the brakes off. Should power fail, the brakes are applied instantly. The solenoid also has the secondary function of acting as a bleeder resistor for the d.c. power supply.

Latching relays and a memory-latching relay are in use for the various tape motions. As a result it is possible to move to FAST FORWARD or REWIND without disengaging the play switch. When the tape is stopped, the pinch roller solenoid will not be reactivated until the reels have *fully* stopped.

There is an additional relay system, using a light activated photo-electric cell to sense the physical position of the tape. If the tape should run out, in any mode of operation, or break, the d.c. brakes are instantly activated. Clear portions of tape can thus be used as stop cues at any point on a reel.

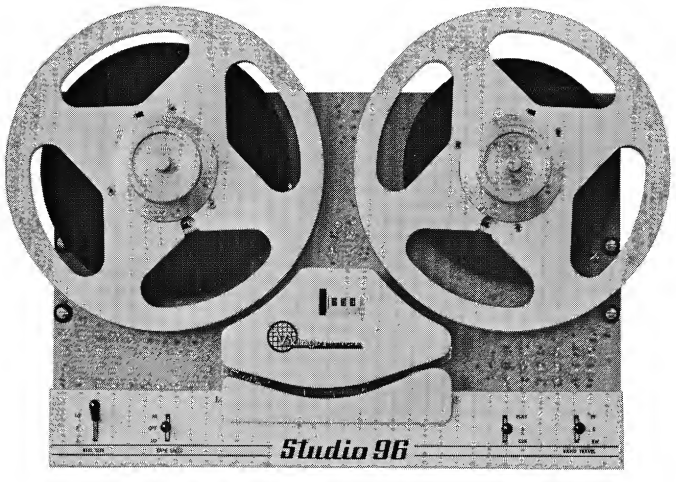
As a result of the interaction of these relays the deck becomes as close as possible to completely foolproof. It just won't snap a normal tape. Note that word normal. The excellent Viking manual that accompanies the deck warns against the 0.5-mil and thinner tapes. The high forward and rewind speeds, and their concomitant high braking forces, can do harm to these tapes. These tapes *can* be used, but special care must be taken to prevent full high-speed motion by mechanically hand braking the reels.

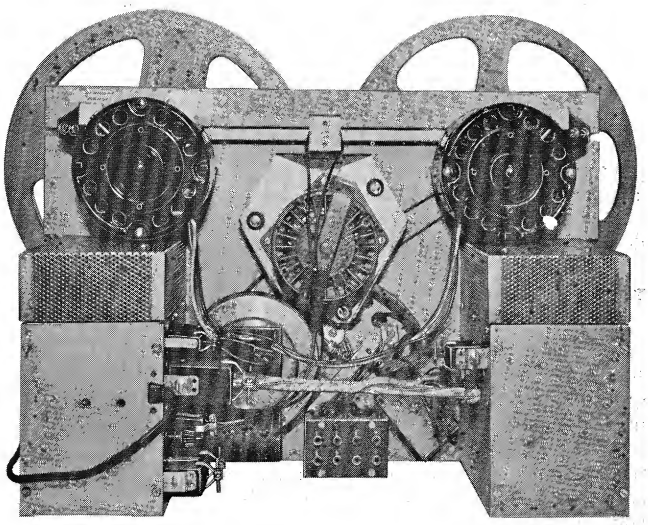
These reel tables have an interesting feature. They are normally set for the standard small reels. However, they contain pull-out hubs to fit the large NAB standard. Also, Viking supplies two excellent screw-on reel locks that will fit all types of reels.

The RP 120 Preamplifier

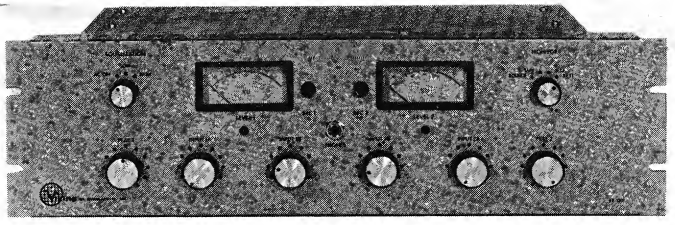
This is a physical match to the transport. Like it, it is equipped to fit a standard 19-inch rack mount, as shown in *Fig.* 3. Also, it has the same grey hammertone finish, though the panel is thinner metal. The over-all *feel* is entirely in keeping with the professionalism of the entire unit.

The external appearance is dominated by two *true* VU meters. Flanking these on the outside are respectively, an equalization selector (also the a.c. on-off switch),





Figs. 1 and 2. Front and rear views of the Viking Studio-96 transport.



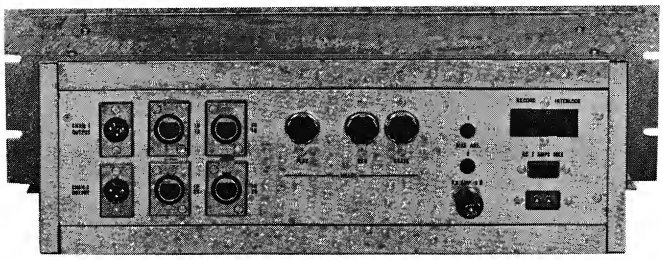


Fig. 3 (left). Front and rear views of the RP-120 amplifier.

and a monitor selector. On the inboard side of the meters are two push buttons used to activate the record circuits. The three lower knobs for each channel are for mike, high-level inputs and for playback level. Finally there is an earphone jack designed to accept the standard three-contact stereo plug.

The rear panel has all other connectors. In addition to the feeds from the transport, there are the two sets of inputs and the pair of outputs. These use standard three-contact Cannon XL type connectors. Normal input is for high-impedance microphone and unbalanced lines. Viking has provision, and accessory plug-ins, for converting to low impedance and balanced-line input from 600 ohms. The output is also unbalanced and at high impedance. And, again, there is a plug-in transformer available for conversion to broadcast-line requirements.†

The RP 120 is entirely solid-state in design. A total of 20 silicon planar transistors; one germanium power transistor; 6 silicon diodes; 8 germanium diodes; and one Zener diode are employed. The bulk of these are to be found on five circuit boards. These boards are: a bias oscillator, stereo record circuit, stereo play circuit, stereo input circuit, and stereo output circuit. These boards slide into plug-in contact holders. Thus they are instantly replaceable if necessary.

Servicability seems to be one strong point of both the deck and the preamp. Whenever possible, Viking has provided sectional plug-in design. For example, in addition to the circuit boards, there are plug-in control boxes for the transport. The over-all approach seems to be that of a unit that will suffer a minimum of downtime in any professional application.

Test Results

It must be first stated that the transport/preamplifier performed as easily and as surely as the most fussy user could require. Tape motion is faultless. There is no tape slap, even if the start follows a rewind motion. What with the memory relay system, it apparently takes considerable skill to arrive at a situation where you can break a tape—a skill which we lacked. Tape would not break and it would not spill. Even pulling the a.c. plug in high-speed motion will do nothing since the mechanical relay comes into play to brake the reels to a stop.

The preamp offers the same satisfactions. The VU meters in addition to being electrically flat, have the kind of ballistics we like in a volume indicator. The respective gain pots are positive, smooth, and non-binding.

Fig. 4 shows the 7½-ips NARTB response to Ampex Test Tape 31321-01. Except for the slight rise in the bass region, it could hardly be improved upon.

Also shown is the over-all record playback response at the two speeds. They were taken at a —10 dB record level on Scotch brand 111 tape.

What the curves do not show is that waveform purity was exceptional. Even at the extraordinary high frequency extremes harmonic distortion was extremely low. We also made specific measurement of IM distortion at various record levels. At a 100 per cent equivalent figure, IM was 2.8 per cent. Note that this is playback off the tape. This is indeed an excellent figure.

Total signal-to-noise unweighted was —47 db left and —45 db right. This is below a maximum 1000 Hz signal and also represents an excellent figure for quarter-track heads.

Flutter and wow measurements came up with figures that exceed the manufacturer's specifications. At 7½ ips, flutter was 0.08 per cent; at 3¾ ips, it was 0.2 per cent.

Separation at 1000 Hz was in excess of the signal-to-noise ratio. At 10,000 Hz the channels were still 46 dB apart. At the extreme of 20,000 Hz separation was a highly satisfactory —41 dB.

Finally, we checked the fast forward and rewind speeds. 1800 feet on a 7-inch reel took 1 minute 28 seconds. A bit slower than we expected but certainly satisfactory.

At $598.95 for the Studio 96 and $399.00 for the RP 120, much is to be expected from this system. What the specifications fail to tell, and our physical examination did, is that these units are built to last. One of the prime demands of a professional piece of gear is a long-term reliability. This is something that is difficult indeed to test in the laboratory. However, we can see the quality of componentry used. Good solenoids and relays are expensive. But to the professional that expense is an economy since down time is lost money. These Viking units show every evidence to the effect that down time will be a rarity. Further, the units are readily serviceable. Add, to this the fact that our ears fully agree with that which our instruments have found. The net result is a pair of units that have every right to that much abused word "professional."

† MANUFACTURER'S NOTE

This reprint represents an accurate and complete copy of the equipment profile as it appeared in AUDIO magazine.

For the benefit of the reader an inadvertent error is here corrected:

The RP120 amplifier output is not "... unbalanced and at high impedance". Also, the "... plug-in transformer available for conversion to broadcast line requirements ..." is neither available nor necessary. The Stereo **RP120** (and monaural **RP110**) amplifiers already have balanced low impedance outputs for broadcast line as standard equipment.

Viking of Minneapolis, Inc.

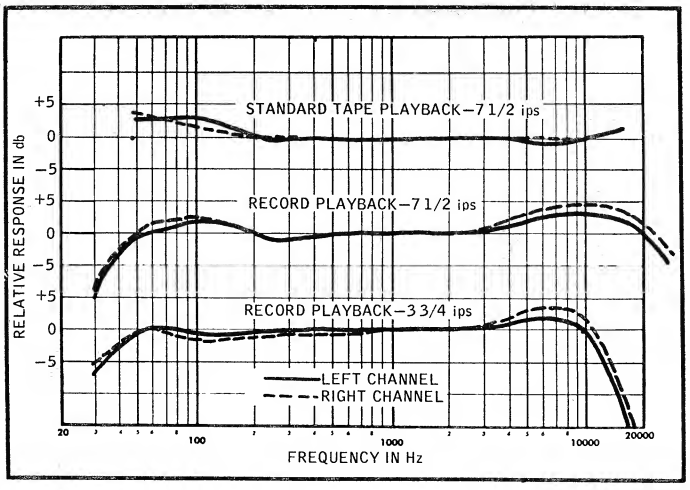


Fig. 4 (right). Frequency - response curves of the Viking Studio-96/RP-120 tape recorder system.